## CONTENTS

## O NATIONAL ACADEMY OF SCIENCES

Symposium on Organ Transplantation in Man	1017
Symposium on Organ Transplantation in Man Introduction	1018
Basic Genetical and Immunological Considerations	-
By Rupert E. Billingham	1028
HISTOCOMPATIBILITY GENETICS AND IMMUNOSUPPRESSION . By Fritz H. Back.  TRANSPLANTATION OF A PAIRED ORGAN, THE KIDNEY . By John P. Merrill	1020
TRANSPLANTATION OF A PAIRED ORGAN, THE KIDNEY	1030
By Norman E. Shumway	1032
ETHICAL ASPECTS AND SOCIOLOGICAL IMPLICATIONS OF ORGAN TRANSPLANTATION	35
AS A THERAPEUTIC PROCEDURE	1034
PHYSICAL SCIENCES	
ASTRONOMY.—THE MANGANESE MERCURY STAR #1 BOOTIS	
	1039
Astronomy.—Emission-Line Objects Projected upon the Galactic Bulge.	Ş.,
By G. H. Herbig	1045
GEOPHYSICS.—HOMOGENEOUS CATALOGS OF EARTHQUAKES	1051
Physics.—On the Motion of a Sphere in a Perfect Fluid, with Application to	1001
Liquid Helium	1055
CHEMISTRY.—On THE CONFORMATIONS OF HALLUCINOGENIC MOLECULES AND THEIR	i N
CORRELATION	1063
CHEMISTRY.—HIGH-RESOLUTION PROTON NUCLEAR MAGNETIC RESONANCE	3.4
SPECTROSCOPY OF CYTOCHROME c	1071
MATHEMATICS.—WILDER MANIFOLDS ARE LOCALLY ORIENTABLE.	1070
MATHEMATICS.—CONJUGATE POINTS OF SECOND-ORDER LINEAR DIFFERENTIAL	A
EQUATIONS	1082
WIATHEMATICS.—TOWARD A STOCHASTIC CALCULUS, II	1084
BIOLOGICAL SCIENCES	lear-
Anthropology.—A Molecular Time Scale for Human Evolution	1000
PSYCHOLOGY.—KINETICS OF MEMORY CONSOLIDATION: ROLE OF AMNUSIC TREATMENT	1088
PARAMETERS	1004
MEDICAL SCHENCES.—THE PATHOGENESIS OF AUTOIMMUNITY IN NEW ZEALAND MICE.	LUME
I. Induction of Antinucleic Acid Antibodies by Polyinosinic Polycytidalic	
ACID By Alfred D. Steinberg, Samuel Baron, and Norman Talal	1102
MEDICAL SCIENCES.—ANTIBODIES TO RIBONUCLEIC ACID IN SYSTEMIC LUPUS	
	1108
MEDICAL SCIENCES.—THE EFFECTS OF CENTRALLY ACTING DRUGS ON TREMOR IN MONKEYS WITH MESENCEPHALIC LESIONS	
By M. Goldstein, A. F. Battista, S. Nakatani, and B. Anagnoste	1112
Physiology.—Increase in Rat Brain Tyrosine Hydroxylase Activity Produced	1110
BY ELECTROCONVULSIVE SHOCK	
. By Jose M. Musacchio, Louis Julou, Seymour S. Kety, and Jacques Glowinski.	1117
PHYSIOLOGY.—THE ACTION SPECTRUM FOR BREAKING DIAPAUSE IN THE CODLING	
MOTH, Laspeyresia pomonella (L.), AND THE OAK SILKWORM, Antheraea pernyi	
Guer	1190
MICROBIOLOGY.—A Nondefective (Competent) Adenovirus-SV40 Hybrid Isolated	1120
FROM THE AD.2-SV40 HYBRID POPULATION	
36 7 7 1 TTT 171 TT TTT 1 00 1 0 0 1 1 1 1 1 1 1 1 1 1	1128
(Continued on inside back	cover)

)

)

	CONTENTS (Continued from back cover)	
	MICROBIOLOGY.—CELLS INVOLVED IN THE IMMUNE RESPONSE, IX. DEPLETION FROM THE NORMAL RABBIT BONE MARROW OF ANTIGEN-REACTIVE CELLS DIRECTED TOWARD HUMAN PERIPHERAL LEUKOCYTES	
	By Nabih I. Abdou and Maxwell Richter Microbiology.—Biochemical Evidence for Induction by Polyoma Virus of Replication of the Chromosomes of Mouse Kidney Cells	1136
	MICROBIOLOGY.—NATURAL IMMUNITY TO BACTERIAL INFECTIONS: THE RELATION OF COMPLEMENT TO HEAT-LABILE OPSONINS	1144
	By Mary Ruth Smith, Hyun S. Shin, and W. Barry Wood, Jr. Microbiology.—Fluorometric Quantitation of Fluorescein-Coupled Antibodies	1151
	ATTACHED TO THE CELL MEMBRANE By Roberto Strom and Eva Klein Microbiology.—DNA of Bacteriophage PM2: A Closed Circular Double-Stranded Molecule	1157
)	ZOOLOGY.—Embryonic Cell Adhesiveness: Do Species Differences Exist among Warm-Blooded Vertebrates?	1164
	Zoology.—On the Proportions between Some Areas of the First Cervical	1169
	SEGMENT OF THE SPINAL CORD OF PRIMATES	1174
)	GENETICS.—THE RATE OF MOLECULAR EVOLUTION CONSIDERED FROM THE STANDPOINT OF POPULATION GENETICS	1181
	GENETICS.—DEMONSTRATION OF THE UNIVERSALITY OF THE GENETIC CODE in vivo by Comparison of the Coat Proteins Synthesized in Different Plants by Tobacco Mosaic Virus RNA	
		1189
		1196
J	By Barbara Shaffer, Joanna Rytka, and Gerald R. Fink BIOCHEMISTRY.—EVIDENCE FOR A PROPOSED INITIATION COMPLEX FOR PROTEIN SYNTHESIS IN RETICULOCYTE POLYRIBOSOME PROFILES	1198
	BIOCHEMISTRY.—ALKALINE PH DEPENDENCE OF &-CHYMOTRYPSIN-CATALYZED	1206
	HYDROLYSIS OF SPECIFIC SUBSTRATES . By Pablo Valenzuela and Myron L. Bender BIOCHEMISTRY.—L-URIDINE: SYNTHESIS AND BEHAVIOR AS ENZYME SUBSTRATE	1214 1222
	BIOCHEMISTRY.—Homology of Pseudomonas Cytochrome c-551 with Eukaryotic c-Cytochromes	1227
	BIOCHEMISTRY.—MÖSSBAUER SPECTROSCOPY OF THE IRON-SULFUR PROTEINS	1234
	BIOCHEMISTRY.—COMPARED EFFECTS OF DITHIOTHREITOL ON THE INTERACTION OF AN AFFINITY-LABELING REAGENT WITH ACETYLCHOLINESTERASE AND THE EXCITABLE MEMBRANE OF THE ELECTROPLAX	
	BIOCHEMISTRY.—INTRAMOLECULAR LOCALIZATION OF THE ACCEPTOR CROSS-LINKING	1239
	Sites in Fibrin	1247
	Conformation, Electron Distribution, and Biological Activity	1253
	BIOCHEMISTRY.—INDUCTION OF Euglena TRANSFER RNA'S BY LIGHT	1261
	BIOCHEMISTRY.—EVIDENCE FOR MULTIPLE GENE CONTROL OF A SINGLE POLYPEPTIDE	1269
	CHAIN: THE HEAVY CHAIN OF RABBIT IMMUNOGLOBULIN	1274
	(Continued on facin	

BIOCHEMISTRY.—PARTIAL PURIFICATION OF NATIVE RRNA AND TRNA CISTRONS FROM	1000
Mycoplasma sp. (Kid) By John L. Ryan and Harold J. Morowitz	1282
BIOCHEMISTRY.—GANGLIOSIDES IN DNA VIRUS-TRANSFORMED AND SPONTANEOUSLY TRANSFORMED TUMORIGENIC MOUSE CELL LINES	
By Peter T. Mora, Roscoe O. Brady, Roy M. Bradley, and Vivian W. McFarland	1290
BIOCHEMISTRY.—REGULATION OF THE SYNTHESIS OF NUCLEOTIDE PHOSPHOHYDROLASE	1290
AND NEUTRAL DEOXYRIBONUCLEASE: Two Activities Present within Purified	
VACCINIA VIRUS	1297
BIOCHEMISTRY.—PENICILLINASE PLASMID DNA FROM Staphylococcus aureus	
By Mark G. Rush, C. N. Gordon, Richard P. Novick, and Robert C. Warner	1304
BIOCHEMISTRY.—PTERIDINES AND THE FUNCTION OF THE PHOTOSYNTHETIC REACTION	
	1311
CENTER	
AND BIOTIN CARBOXYLASE SUBUNITS	
By Alfred W. Alberts, A. M. Nervi, and P. R. Vagelos	1319
BIOCHEMISTRY.—GENETIC FUNCTIONS OF THE CHLOROPLAST OF Chlamydomonas	
reinhardi: Effect of Rifampin on Chloroplast DNA-Dependent RNA	
POLYMERASE	1327
BIOCHEMISTRY.—PEPTIDYL TRANSFERS IN GRAMICIDIN S BIOSYNTHESIS FROM ENZYME-	
BOUND THIOESTER INTERMEDIATES	400
	1335
BIOCHEMISTRY.—MECHANISM OF DNA CHAIN GROWTH, III. EQUAL ANNEALING OF T4	
NASCENT SHORT DNA CHAINS WITH THE SEPARATED COMPLEMENTARY STRANDS OF	
THE PHAGE DNA	1343
BIOCHEMISTRY.—BACTERIOPHAGE T4 DNA-DEPENDENT in vitro SYNTHESIS OF	1940
LYSOZYME By Manfred Schweiger and Lawrence M. Gold	1351
BIOCHEMISTRY.—Base Pairing in 5-Chlorouridine	1001
	1359
BIOCHEMISTRY.—INHIBITION OF HUMAN BRAIN PYRUVATE KINASE AND HEXOKINASE BY	
PHENYLALANINE AND PHENYLPYRUVATE: Possible Relevance to Phenyl-	
KETONURIC BRAIN DAMAGE	1365
BIOCHEMISTRY.—In vitro Synthesis of Different Categories of Specific Protein	
BY MEMBRANE-BOUND AND FREE RIBOSOMES	
By M. Clelia Ganoza and Curtis A. Williams	1370
BIOCHEMISTRY.—CRYSTALLIZATION OF A MULTIENZYME COMPLEX: FATTY ACID	
SYNTHETASE FROM YEAST By D. Oesterhelt, H. Bauer, and F. Lynen	1377
BIOCHEMISTRY.—TRANSFER RNA: A COMPARISON BY GEL ELECTROPHORESIS OF THE	
TRNA IN HELA CYTOPLASM, HELA MITOCHONDRIAL FRACTION, AND E. coli	1000
Brownson Brown Assess Assess Brown Brown Company Compa	1383
BIOCHEMISTRY.—THE AMINO ACID SEQUENCE OF BOVINE CARBOXYPEPTIDASE A	1389
By Ralph A. Bradshaw, Lowell H. Ericsson, Kenneth A. Walsh, and Hans Neurath Biochemistry.—An L-Glutamine Requirement for Intercellular Adhesion	1999
By Steven B. Oppenheimer, Michael Edidin, Charles W. Orr, and Saul Roseman	1395
BIOCHEMISTRY.—NUCLEAR MAGNETIC RESONANCE STUDIES OF HEMOGLOBINS, III.	1000
Evidence for the Nonequivalence of $\alpha$ - and $\beta$ -Chains in Azide Derivatives	
OF METHEMOGLOBINS By Donald G. Davis, Samuel Charache, and Chien Ho	1403
BIOCHEMISTRY.—THE NEGATIVE CONTROL MECHANISM FOR E. coli DNA REPLICATION.	
By Barbara Hatch Rosenberg, Liebe F. Cavalieri, and Grace Ungers	1410
BIOCHEMISTRY.—INTERACTION OF THE CARBOHYDRATE-BINDING PROTEIN CONCAN-	
AVALIN A WITH NORMAL AND TRANSFORMED CELLS	
	1418
BIOCHEMISTRY.—ENZYMATIC INACTIVATION OF PEPTIDE HORMONES POSSESSING A	
C-TERMINAL AMIDE GROUP	
	1426
BIOCHEMISTRY.—DEACYLATED TRNAPhe BINDING TO A RETICULOCYTE RIBOSOMAL SITE	
FOR THE INITIATION OF POLYPHENYLALANINE SYNTHESIS	1491
BIOCHEMISTRY.—SOLUBILIZATION AND PARTIAL CHARACTERIZATION OF A PHYTO-	1431
HEMAGGLUTININ RECEPTOR SITE FROM HUMAN ERYTHROCYTES	
Bu Stuart Kornfeld and Rosalind Kornfeld	1439